

shining; dorsopleural membrane whitish; halteres yellow, knobs brown; legs yellow, tarsi and the tips of the femora and tibia darker; abdomen honey yellow, darker posteriorly, with black dots on the lateral margin of each segment which are sometimes incompletely connected by brownish stripes; a brownish spot on the first sternite; eighth tergite somewhat produced and narrowed posteriorly, posterior margin with two tufts of long reddish hair; hypopygium large, reddish yellow; posterior margin of upper lamella with a slight median incision, lateral angles produced into short, slender, acute points; lower lamella with a rather deep incision in which lies a pair of short reddish-brown appendages the tips of which are fringed with long yellow hair; base of ovipositor honey yellow, shining, valves reddish, upper valves slightly arcuate, long, slender, acute; lower valves broader, obtuse, reaching beyond the middle of the upper valves; wings hyaline, subcostal cell and stigma with a slight yellowish tinge; a very faint scarcely perceptible whitish streak running from in front of the stigma across the base of the discal cell; discal cell twice as long as wide. Length, male 15 mm., female 18 to 20 mm., wing 17 mm.

Habitat: Moscow Mt., Idaho, one male, one female. (Type) Doane. Collins, Ida., two males. Piper. Type no. 200, Wash. Agric. Coll. & S. of S.

THE SOUTHERN CORN-LEAF BEETLE: A NEW INSECT PEST OF GROWING CORN.

PLATES VII-IX.

BY F. M. WEBSTER.

While investigating the habits of the species of *Simulium*, inhabiting the country adjacent to the Mississippi River in Arkansas and Louisiana, early in April, 1887, I observed in a small field of corn, on the old Perkins Plantation, at Somerset Landing, Tensas Parish, Louisiana, a number of beetles, *Myochrous denticollis* Say, attacking the young corn.

They were found, largely, in the soil about the stems of the plants at or very near the surface of the ground, where they seemed to be engaged in gnawing the bases of the outside leaves, and were not then observed to depredate upon the upper portion of the leaves, nor were they at any time observed running over the plants. At the time, however, the corn plants were very small, not having put forth more than three or at most four leaves. No serious injuries were observed at the time, and more pertinent investigations prevented my giving them further attention. I was not then aware of what has

since been learned, viz., that the beetles are quite easily alarmed, and, when disturbed, drop to the ground and secrete themselves in crevices, under clods, or about the bases of the plants. There was no evidence, in this field, to throw any light upon the food plants of the species, other than corn.

These facts were recorded in substance by the writer in Report of United States Commissioner of Agriculture, for the year 1887, p. 147, and up to the present year, this has remained the only published notice relative to the food habits of the insect, so far as I have been able to learn. Prof. S. J. Hunter, in a recent letter, reports injury to young corn, at Hartford, Kansas, May 31, 1894, and Prof. S. A. Forbes writes me that it had been taken at Cobden, Union county, Illinois, on corn. Mr. W. H. Ashmead, in his "Notes on Cotton Insects in Mississippi" published in *Insect Life*, Vol. VII, pp. 25-29, 240-247, 1894, includes the species among those found on the cotton plant, but it was not observed to feed thereon.

The species was described in 1824* by Thomas Say, under the name of *Colaspis denticollis*, as follows:

C. denticollis.—Lateral thoracic edge three-toothed; elytra serrate. Inhabits Missouri.

Body black, slightly bronzed, covered with dense, robust, cinereous hairs: antennæ dull rufous at base; thorax with three equal, equidistant teeth on the lateral edge; elytra with lateral edge minutely dented; tip simple; anterior tibiæ and posterior thighs one-toothed. Length, nearly one-fifth of an inch.

To the ordinary observer, these beetles are about three-sixteenths of an inch long and about one-third as wide as long, frequently so covered with earth, which becomes intermixed with the dense hairs, that they look more like animated bits of soil than they do like insects. See Plate VII, Figs. 1, 2, 1 dorsal, and 2, lateral views.

The species is clearly a southwestern one, and, probably, one of those that has worked its way northward from Mexico, and, perhaps, Central America. But on this point I shall have more to say later. Its distribution in the United States may be outlined as extending from Washington, D. C., to extreme southwestern Iowa, southern Arizona, and Texas, Florida and Virginia. The exact localities, so far as

* *Jour. Phila. Acad. Nat. Sci.*, Vol. III, p. 448, being Descriptions of Coleopterous Insects Collected in the late Expedition to the Rocky Mountains, performed by order of Mr. Calhoun, Secretary of War, and under command of Major Long.

I have been able to obtain them, are as follows: Washington, D. C. (Chittenden); Columbus (J. S. Hine), Marietta,* and Cheshire, Ohio (Webster); Kentucky (S. J. Hunter), Kentucky, opposite Cincinnati, Ohio (Dury, 25 years ago); Paxton,* Indiana; Urbana, Champaign county, and Clay, Jackson, Union and Pulaski counties, Illinois (Forbes); Kirkwood,* Cadet,* Missouri City,* Missouri; Eastport, Iowa (Wickham); Lawrence, Douglass county and Hartford, Lyon county, Kansas (Hunter); Vinita, Indian Territory (Wickham); Tucson, Arizona (Wickham); Las Cruces,* New Mexico; El Paso (LeConte), Dallas,* Columbia,* Columbus* (Wickham), Victoria,* Brownsville* (Wickham), Texas; Somerset Landing (Webster), New Orleans (Forbes), Shreveport,* Louisiana; Vicksburg,* Mississippi; Archer,* Capon,* Enterprise,* Florida; Fortress Monroe,* Virginia. LeConte includes the species in his list of Coleoptera of Kansas and Nebraska, and also in his list for eastern New Mexico, but does not give exact localities. See map, Plate IX.

The first information that I had of this insect, in destructive abundance, in Ohio, came from Mr. Alva Agee, of Cheshire, who wrote me under the date of June 2, 1900, to the effect that "The miserable fellows helped to eat up a field of corn."

As Mr. Agee had accompanied his complaint with specimens of the insect, there was no doubt as to its identity, and on June 4th I sent my assistant, Mr. Newell, to investigate the matter. It was found that the area of serious depredation was not confined to a single field, but covered a territory about three miles square, rather rough and uneven in its topography, with the worst infested fields located upon the hills and ridges, and consisting, uniformly, of lands that had the previous year been devoted to pasture, or else had several years prior to the present been allowed to lapse into a semi-wild condition. Farmers in the neighborhood had observed the work of the insect for about four years.

The beetles commence their work, in this locality, about the first week in May, or as soon as the corn plants appeared above ground. They feed during early morning or toward evening, during clear days when the sun shines, but during cloudy days they may be observed thus engaged at any time. If there are passing clouds, they will feed while the sun is obscured, but as soon as the clouds pass from before

* Specimens in the United States Nat. Museum.

the sun, they quickly seek cover from its hot rays and hide themselves away under clods, in crevices in the ground or about the bases of the plants, showing no inclination to take flight, but running rapidly.

On June 7th, a female was dissected, and eggs found in the ovaries. These eggs were yellow in color, cylindrical, and estimated to be about 1 mm. in length and about one-fifth as broad as long, with the ends roundly truncated. It has not yet been possible to observe where the eggs are deposited, nor have I been able to learn where the insect passes the larval and pupal stages. As it belongs to a group of beetles which includes *Paria*, *Fidia*, *Colaspis*, *Heteraspis* and several other genera, species of which are known to feed upon the roots of plants, in the larval stage, it is fair to presume that the larvæ of this species are of subterranean habits also.

On July 21st, Mr. Newell again visited the same locality and found a few beetles still feeding upon the corn plants, usually inside of the unfolding leaves or on the tassels. The effects of their attacks upon the corn plant is shown in Plate VII, Fig. 3, while the general effect is illustrated in Plate VIII, Fig. 1, from a photograph taken by Mr. Newell on July 23d, showing the condition of a field at that date, the standing corn being that from a second planting. In a corner of this field was a small space where the second planting had not been attacked, and this is illustrated in Plate VIII, Fig. 2, showing what the condition of the entire field should have been, even after the first planting had been destroyed by the *Myochrous*. Both in the fields and in our breeding cages the beetles fed freely on corn, timothy and crabgrass, *Panicum pubescens*, but very sparingly on bluegrass and redtop, and it is doubtful if the beetles can survive on the latter two.

October 24, 1900, I found a few beetles about asters and feeding on young belated broom corn. April 12, 1901, Mr. Newell found one adult among asters, showing that at least some of the insects winter over in that stage. No material damage has been done in the locality the present year, up to July 15th.

A species of larvæ were found in great abundance about the roots of two species of *Aster*, *A. pilosus* var. *platyphyllus* and *A. hirsuticollis*, (?) upon the roots of which they evidently subsist. Owing to the fact these larvæ were swept off in myriads by the ravages of *Sporotrichum globuliferum*, I was only able to rear a single adult, which Prof. C. H. Fernald thinks may prove to belong to a new species of Tortricidæ. Early in November, 1900, I visited the locality and

about the roots of these same species of *Aster* found great numbers of a coleopterous larvæ which from their resemblance to the larvæ of other Eumolpini seemed likely to be those of *Myochrous denticollis*, but again, on account of the attack of *Sporotrichum*, only a single adult has been reared and that a *Paria*.

By the accompanying map, Plate IX, I have endeavored to illustrate the known distribution of this and the other two species of the genus *Myochrous*, not as in any way throwing additional light upon the food habits of *M. denticollis*, though one of them, *M. squamosus*, seems to have the habit of collecting under dried excrement of the Bison, when these existed in its area of distribution, and, later, under the dried excrement of cattle. Mr. Dury tells me that he always collected *M. denticollis* under boards and similar objects laying on the ground, and on low lands.

In their distribution, *M. denticollis* inhabits the country east of a line drawn from southwestern Iowa to Tucson, Arizona, while *M. squamosus* ranges from northern Arizona and New Mexico to the Platte River in Nebraska and northwest into Montana, probably through western South Dakota and Wyoming. *M. longulus*, the only remaining species of the genus to be mentioned, is known to range from southern California and Arizona, northward into Colorado, where it has been reported by LeConte, without exact locality. It not unlikely occurs also in Utah, though it has not yet been reported from there in our literature, so far as I am able to learn, but in any case overlapping the territory inhabited by *M. squamosus* in northern Arizona and New Mexico, and also, probably, in Colorado, while the latter species borders on and possibly mingles with *M. denticollis* in southwestern Arizona, eastern New Mexico, western Kansas, and, probably, extreme southeastern Nebraska.

In their anatomical affinities, *denticollis* is the most remote from *squamosus*, though their habitat is contiguous if not indeed overlapping, and the nearest to *longulus*, whose habitat is far to the south, and only touching in Arizona. Thus it would seem that the first two had been the earliest species to push northward, and have become the most widely separated in structure, while *longulus* seems to have been the latest to enter our fauna. The genus *Diabrotica* offers some very good illustrations of the evolution of species along the west coast, independently, as it would appear, from those along the eastern shores. Hence, *M. longulus* might very probably represent a west coast variation.

From what we know of the genus *Myochrous*, in Mexico and to the southward, we may with more data be able to trace *denticollis* back to its southern home. According to Mr. Martin Jacoby,* *M. melancholicus*, a species very closely allied to *denticollis*, occurs at Durango, Pueblo and Tabasco, in Mexico, and also in Panama, thus already implying a possible origin of the latter species. *M. femoralis*, also closely allied to *denticollis*, occurs in British Honduras, which rather strengthens this theory. Other species of the genus inhabiting the country to the southward of the United States, are *sallei*, *albovillosus* and *carinatus*, from Mexico, and *tibialis*, from British Honduras and Guatemala.

EXPLANATION OF PLATE VII.

- Fig. 1. *Myochrous denticollis*, dorsal view.
 Fig. 2. " " lateral view.
 Fig. 3. Corn plant showing ravages of *Myochrous denticollis*.

EXPLANATION OF PLATE VIII.

- Fig. 1. General effect of attacks of *M. denticollis*.
 Fig. 2. Corner of same field where the plants from second planting were not destroyed.

EXPLANATION OF PLATE IX.

Map showing distribution of *Myochrous denticollis*, *M. squamosus* and *M. longulus*.

ON SOME BEES OF THE GENUS ANDRENA FROM NEW JERSEY.

By T. D. A. COCKERELL.

The females of the species under consideration may be separated by the following table. I have included two species of *Colletes* which resemble *Andrena* and may be confused with it. The material herein discussed was collected by Dr. J. B. Smith, and consists of species on which he has made biological observations.

Base of metathorax (propodeum) with a transverse ridge enclosing a narrow strongly plicate area.....	1.
Base of metathorax without such a ridge.....	2.
1. Hair of thoracic dorsum pale ochraceous and black.....	<i>Colletes inaequalis</i> Say.
Hair of thoracic dorsum bright orange-ferruginous.....	<i>Colletes thoracica</i> Smith.
2. Larger species; abdomen shining black without hair-bands; thorax covered with ochraceous hair.....	3.
Smaller species; abdomen with hair-bands at least partially developed.....	5.

* *Biologia Centrali-Americana*, Vol. VI, Pt. 1, and Supplement, Pt. 1.